JOB SATISFACTION AND EMPLOYEE RETENTION BY PUBLIC AND PRIVATE IT ORGANIZATIONS

SATISFAÇÃO NO TRABALHO E RETENÇÃO DE PROFISSIONAIS EM ORGANIZAÇÕES DE TI PÚBLICAS E PRIVADAS

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ABSTRACT

Purpose: Examine the relationship between global job satisfaction, as well as the dimensions of satisfaction (satisfaction with the nature of work, colleagues, leadership, salary and promotions), with the retention of IT professionals in public and private IT institutions.

Design/methodology/approach: Data were collected from 252 professionals from IT institutions (139 from public institutions and 113 from private institutions) located in the state of Santa Catarina, Brazil. Data were collected using a survey and analyzed via Spearman's rank correlation coefficient.

Findings: There was no positive correlation between the measures of global satisfaction nor the satisfaction with the nature of work, colleagues, leadership and promotions with retention of professionals. Only the satisfaction with salary showed positive correlation with retention of IT professionals in public and private IT institutions.

Practical implications: These results set the ground for the establishment of policies aimed at retaining IT professionals, especially related to salary.

Originality/value: This study investigates not only the global measurement of satisfaction but also its dimensions. The study shows for the first time that global job satisfaction isn't retaining professionals in public not private IT organizations, and that retention strategies need to focus especially on salary satisfaction of these professionals.

Keywords: Job satisfaction. Employee retention. Information Technology professionals. Information Technology businesses. Public businesses.

RESUMO

Objetivo: Examinar a relação da satisfação global no trabalho, assim como das dimensões da satisfação (satisfação com a natureza do trabalho, satisfação com os colegas, satisfação com a chefia, satisfação com o salário, satisfação com as promoções), com a retenção de profissionais de TI em organizações de TI públicas e privadas.

Design/metodologia/abordagem: Participaram da pesquisa 252 profissionais (139 de organizações públicas e 113 de organizações privadas) de organizações localizadas no estado de Santa Catarina, Brasil. Os dados foram coletados por meio de *survey* e analisados por meio do teste estatístico de *Spearman.*

Resultados: Não houve relação positiva entre a medida global de satisfação dos profissionais de TI e das dimensões satisfação com colegas, satisfação com a chefia, satisfação com a natureza do trabalho e satisfação com as promoções e a sua retenção. Apenas a satisfação com o salário apresentou relação positiva com a retenção dos profissionais nas organizações de TI públicas e privadas.

Implicações práticas: Os resultados encontrados geram insumos para o estabelecimento de políticas de retenção dos profissionais de TI, especialmente relacionadas ao salário.

Originalidade/valor: Este estudo investigou não apenas a medida global de satisfação com o trabalho, mas também as suas dimensões. O estudo demonstra, de forma inédita, que a medida global de satisfação com o trabalho não retém profissionais de TI em organizações de TI públicas e privadas e que estratégias de retenção precisam focar especialmente na satisfação desses profissionais com o seu salário.

Palavras-chave: Satisfação no trabalho. Retenção de pessoas. Profissionais de tecnologia da informação. Empresas de tecnologia da informação. Empresas públicas.ivos Reais

1 INTRODUCTION

The IT professional is fundamental to the technological transformation of companies. They are a knowledge worker, with motivation and capability to co-create products and services, however, they are less loyal to their employers than other professionals (Crespi-Vallbona & Mascarilla-Miró, 2018). The retention of these IT professionals is critical to organizations (Zhang & Jones, 2011; Mourmant, Gallivan, & Kalika, 2009). These professionals have specialized skills which are difficult to substitute (Mcknight, Phillips, & Hardgrave, 2009), they're highly qualified and are the spearheads of social development and technological change (Adams & Demaiter, 2008). Therefore, retaining them contributes to safeguarding their knowledge and abilities by the company (Mcknight, Phillips, & Hardgrave, 2009; Steil, Penha, & Bonilla, 2016).

To deliver performance and sustain its growth, the IT industry needs a continuous supply of high performing and loyal employees. The average voluntary employee attrition for 2017–2018 ranged between 14.6 and 15.1 percent (KPMG, 2018). Development and retention of talent is a major challenge in the IT industry. Understanding the needs of talent in this sector to make it sustainable is important (Pant & Venkateswaran, 2019).

IT professionals became even more central to the process of digital transformation due to the need for social distancing and the restructuring of work relations in the face of the COVID-19 pandemic. The global market is going through a strong wave of hiring of such professionals (PageGroup, 2020). Brazil is also going through this same situation (Meirelles, 2020). According to research by the Brazilian Association of Technology Information and Communication Businesses (BRASSCOM) (2019), between 2018 and 2024 the market demand will be for 240 thousand workers in this industry, which is equivalent to around 70 thousand new professionals per year. However, it is estimated that Brazil will graduate 46 thousand people in technology courses in this period, which would generate a deficit for the national market.

Over the last decade there was a shift in the time IT professionals stay at a job in Brazil. During this period, most professionals had 3 or more years of work within the same organization, be it public or private (SOFTEX - Associação para Promoção da Excelência do Software Brasileiro, 2019). A survey with 24 thousand software developers in Brazil showed that 96% of them are open to new work propositions within the terms of the Brazilian Consolidation of Labor Laws Decree (Vulpi, 2020)[1].

The state of Santa Catarina constituted the sixth biggest technology hub in Brazil in number of companies, the fourth biggest in profit, the second biggest in productivity and the third biggest in number of employees (ACATE, 2020). In 2019, even with a raise of 9% in hirings and with open positions, the percentage of professionals who requested termination (voluntary exit) in IT was 43.9%, a value above the average for other sectors in the state, namely 34.6% (ACATE, 2020). These data are alarming for the sector and point that greater attention should be given to the retention of professionals in these organizations.

Research in both management and information systems literature has investigated factors that affect the turnover intentions and behaviours of employees through varied lenses in order to better understand these issues (Harden, Boakye, & Ryan, 2016). Within the investigated factors, job satisfaction is highlighted, as it influences physical and mental health, attitudes and behaviours both inside the organization and in personal life (Martinez & Paraguay, 2003; Barbosa, Bizarria, Rabêlo Neto, & Moreira, 2016). Job satisfaction is defined as the "evaluative state that expresses contentment with, and positive feelings about one's job" (Judge & Kammeyer-Mueller, 2012, p.343).

Other studies analyze IT workers within the lens of IT as a profession. In doing so, they seek to understand the attitudes of IT workers related to the profession, broadening the scope of analysis to outside the bonds of the organization the professional works for (Brooks, Hardgrave, O´Leary-Kelly, McKinney, & Wilson, 2015; Trusson & Woods, 2017). For instance, the study of Brooks et al. (2015) has included constructs as professional identification, satisfaction with profession, and affective commitment to the profession. Other constructs as career entrenchment (Magalhães, 2008) and, more specifically, organizational entrenchment (Rodrigues & Bastos, 2012) have also been proposed to explain the permanence in organizations of employees of different professions, including IT professionals.

Research on job satisfaction in the public sector differs from ones in the private sector, the latter stimulating competition, efficiency and the generation of profit (Ladeira, Sonza, & Berte, 2012; Barbosa et al., 2016). In order to contribute to the understanding of retention of IT professionals in public and private IT organizations, this study aims to examine the relationship between global job satisfaction, as well as its dimensions, and the retention of IT professionals in public and private IT organizations.

Understanding the relations between global job satisfaction and its dimensions and the retention of IT professionals in public and private IT organizations is important due to its scientific and practical implications. To our knowledge, this is the first study to analyze both constructs within this population in private and public IT organizations. Although both types of organizations build their products and services based on the vast array of IT competencies, these organizations tend to put in place different strategies to career development of their employees, which may impact differently IT professionals. This study contributes to the understanding of this relation in the Brazilian reality.

In practical terms, this study provides valuable information for managers, IT professionals and human resource management of private and public IT organizations. Knowing what really matters for IT professionals in IT organizations in terms of global job satisfaction and its dimensions and their relation to these professionals´ retention enables managers and human resource management tackle the issue of retention more assertively. The results of this study may also help IT professionals to plan their career based on scientific information.

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1 In that paper, the work model based on the Brazilian Consolidation of Labor Laws Decree is present in public companies.

2 RESEARCH HYPOTHESES

Job satisfaction is one of the most researched variables in organizational behaviour (Sharma, Misra, & Mishra, 2017), as it is a determinant of retention (Steil, Penha, & Bonilla, 2016; Gallardo-Gallardo & Thunnissen, 2016).

Research including professionals in different positions demonstrates that work satisfaction influences positively their permanence in organizations in diverse contexts (Anis, Rehman, Rehman, Khan, & Humayoun, 2011; Khan, Rehman, Rehman, Safwan, & Ashman, 2011; Pedrycz, Russo, & Succi, 2011; Terera & Ngirande, 2014; Yamamoto, 2011; Iqbal, Guohao, & Akhtar, 2017; Sabbagha, Ledimo, & Martins, 2018). Professionals who are more satisfied in their job are more likely to demonstrate higher dedication to the organization, to be more productive and to stay longer at the organization (Irabor & Okolie, 2019).

Job satisfaction is comprised of five dimensions: satisfaction with colleagues, leadership, salary, promotions and nature of work (Siqueira, 2008). Studies on the relationship between each dimension and retention are yet scarce and incongruent. For example, a study by Steil, Dandolini, Souza, Cuffa, & Costa (2018) did not find a statistically significant relationship between the dimensions of satisfaction and the retention of technical and scientific staff in research and development (R&D) organizations. In contrast, other evidence shows that IT professionals who are satisfied with their leadership and colleagues (Lee, 2004) or with the nature of their work (Westlund & Hannon, 2008) are less likely to leave their organization. In a study with Pakistani public and private organizations, Iqbal, Guohao, & Akhtar (2017) identified that salary influences job satisfaction for workers in diverse positions, and that this has an impact in their retention by organizations.
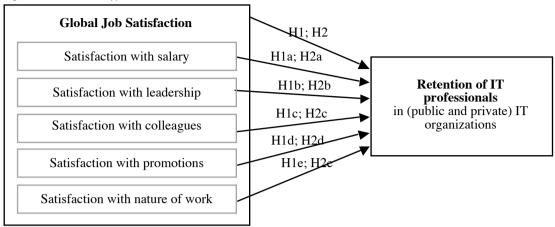
Following such evidence this study tested the following hypotheses:

H1. Job satisfaction: *a higher level of job satisfaction in IT professionals correlates with a longer permanence within public IT organizations.*

H1a. a higher level of satisfaction with **salary** in IT professionals correlates with a longer permanence within public IT organizations.

H1b. a higher level of satisfaction with **leadership** in IT professionals correlates with a longer permanence within public IT organizations.

H1c. a higher level of satisfaction with **colleagues** in IT professionals correlates with a longer permanence within public IT organizations.

H1d. a higher level of satisfaction with **promotions** in IT professionals correlates with a longer permanence within public IT organizations.

H1e. a higher level of satisfaction with the **nature of work** in IT professionals correlates with a longer permanence within public IT organizations.

H2. Job satisfaction: *a higher level of job satisfaction in IT professionals correlates with a longer permanence within private IT organizations.*

H2a. a higher level of satisfaction with **salary** in IT professionals correlates with a longer permanence within private IT organizations.

H2b. a higher level of satisfaction with **leadership** in IT professionals correlates with a longer permanence within private IT organizations.

H2c. a higher level of satisfaction with **colleagues** in IT professionals correlates with a longer permanence within private IT organizations.

H2d. a higher level of satisfaction with **promotions** in IT professionals correlates with a longer permanence within private IT organizations.

H2e. a higher level of satisfaction with the **nature of work** in IT professionals correlates with a longer permanence within private IT organizations.

These research hypotheses can be visualized in Figure 01.

Figure 01 - *Research hypotheses*

3 METHODS

3.1. Sample

The research performed non-probabilistic sampling and surveyed 252 IT professionals of public and private IT organizations in the state of Santa Catarina, Brazil. Third party professionals in those companies were not sampled. Our sample size provides data suitable for further analysis in accordance with statistical calculations[2].

Out of the survey respondents, 139 were from public organizations e 113 from private organizations. For public organizations the majority of respondents had graduate level education, and for private organizations the majority of respondents had undergraduate level education. Most respondents are men, age 19 to 30, married, and hold technical[3] or management[4] positions (Table 1).

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2 Sample size was calculated according to Cronbach's formula: $n = z^2 * p * (1 - p) / e^2$ where *n* is the sample size, *z* is the z-score associated with 95% of confidence level of (here 1,96), *p* is the sample proportion, expressed as a decimal (here 50%), and *e* is the margin of error, expressed as a decimal (here 10%) (Fávero, Belfiore, Silva, & Chan, 2009); thus here $n = 1.96^2 * 0.5 * (1 - 0.5) / 0.1^2$ à $n = 96$.
3 Technical positions most represented in the sample are analyst, assistant, consultant, developer, designer, programmer, technical support.
4 Management positions most represented in the sample are head of department, coordinator, director, manager, leader, supervisor.

Table 1 - *Sample profile*

Sociodemographic data	# of professionals in public organizations	# of professionals in private organizations
All (252 professionals)	139 (55.2%)	113 (44.8%)
Gender		
Men	118 (84.9%)	91 (80.5%)
Women	21 (15.1%)	22 (19.5%)
Age		
18 – 26 yo	0 (0%)	37 (32.7%)
27 – 35 yo	35 (25.2%)	55 (48.7%)
36 – 44 yo	55 (39.6%)	19 (16.8%)
45 – 53 yo	19 (13.7%)	1 (0.9%)
54 – 62 yo	29 (20.9%)	1 (0.9%)
> 63 yo	1 (0.6%)	0 (0%)
Marital status		
Single	18 (12.9%)	49 (43.4%)
Married (including common-law marriage, civil union, cohabitation)	108 (77.7%)	57 (50.4%)
Divorced	11 (8%)	5 (4.4%)
Widowed	2 (1.4%)	2 (1.8%)
Highest education level		
High school or below	0 (0%)	17 (15%)
Undergraduate	59 (42.4%)	62 (54.9%)
Graduate	80 (57.6%)	34 (30.1%)
Position type		
Management	27 (19.4%)	93 (82%)
Non management (technical)	112 (80.6%)	20 (18%)

Source: Research data (2021)

The surveyed professionals had an average tenure in their current job of 14.28 years (sd: 1.61) in public organizations, and 6.89 years (sd: 4.18) in private organizations.

3.2 Dependent variable

Retention was measured as the current tenure (in years) of each professional at their organization. We have only surveyed professionals who had more than 3 years at their organization, as the number of IT professionals who stay less than 3 years at an organization has shown reduction over the years, while the number of IT professionals who stay longer than 3 years has been growing (SOFTEX, 2019). Therefore, for this study we considered an organization as having retained a professional if they stayed longer in an organization than the average IT professional (who stays less than 3 years), i.e. a retained professional is one who stays longer than 3 years. Furthermore, given this choice, it is important we consider that:

> (...) although the current length of service may be a retention indicator, this period is not representative of their total time in the organization. The total time in an organization is the measure that truly reflects his or her retention, but this may only be assessed after that employee has effectively left the organization. Hence, the current length of service in an organization does not fully reflect retention, as it is not yet known how much longer the respondent will remain in the organization (he or she may stay for one day more or many years). Despite this restriction, this still is the best measure for research on professionals who are currently employed in the organization (Steil, Cuffa, Iwaya, & Pacheco, 2020, p.6).

3.3 Independent variable

The short version of the job satisfaction scale (Siqueira, 2008) was used to measure job satisfaction and its five dimensions (Table 2).

Table 2 - *Variables, their dimensions, original validation and measured items*

Variable	Dimensions	Cronbach alpha (dimensions)	Cronbach alpha (variable)	Items and measurement scale
Job satisfaction (Siqueira, 2008)	Satisfaction with colleagues	0.736	0.906 (Brazil*)	15 items, evaluated with a scale ranging from 1 (completely dissatisfied) to 7 (completely satisfied)
	Satisfaction with salary	0.889		
	Satisfaction with leadership	0.950		
	Satisfaction with nature of work	0.859		
	Satisfaction with promotions	0.749		

* The type of organization is not considered for the validation of the tool.

Source: Siqueira (2008)

It is noteworthy that the job satisfaction scale from Siqueira (2008) has been applied recently with results showing consistent psychometric qualities. For example, in a study by Rueda (2015), the Cronbach alpha coefficients were above 0.77; similarly, in this study the Cronbach alpha coefficients are above 0.905.

3.4 Data collection

We used both primary and secondary data. From primary data, we sought to know the reality of retention of public IT professionals in IT organizations located in Santa Catarina, Brazil. These data were collected between September 2018 and March 2019 via online survey. This research was approved by the Ethics Committee in Human Research of the Universidade Federal de Santa Catarina (approval number: 3,254,632).

The secondary data were collected in 2016 as part of a project with a MCTI/CNPq/Universal 14/2014 research grant (process number: 446551/2014-7). This project collected data on the determinants of retention of private IT professionals in IT organizations located in Santa Catarina, Brazil. Both primary and secondary data were collected by the same research team.

3.5. Data analysis

Data were treated via statistical software SPSS. In order to interpret the data relative to job satisfaction we calculated the average score of this variable and each of its dimensions (Siqueira, 2008). Therefore, on a scale of 1 to 7, the closer to 7 the average score is, the higher the satisfaction level of the professional in relation to their work. We considered scores between 1 and 3.9 indicated dissatisfaction, between 4 and 4.9 informed a state of indifference, and between 5 and 7 indicated satisfaction (Siqueira, 2008).

Following this, we verified the existence of missing values and outliers in the sample (Hair Jr. et al., 2009), however the removal of these did not alter the results. For this reason, all values were maintained. We applied the Shapiro-Wilk test and verified that our data do not present normal distribution (p-value ≥ 0.05). As such, we used a non-parametric statistical test, namely the Spearman test (ρ), to verify the research hypotheses.

4 RESULTS

This study examined the relationship between job satisfaction and the retention of IT professionals in public and private IT organizations in Brazil. The descriptive statistics reveal that professionals in public IT organizations showed indifference (average score of 4.55 out of 7) in relation to the global measurement of job satisfaction. On the other hand, professionals of private IT organizations showed dissatisfaction (average score of 3.9 out of 7) in relation to the global measurement of job satisfaction.

The hypotheses referring to a positive relation between global satisfaction and retention of IT professionals in public (H1) and private (H2) IT organizations (Table 3) were rejected.

Table 3 - *Result of the hypotheses tested in this study*

	Hypotheses	Direction and force	ρ	*p-value*	Result
Public IT organizations	H1. Job satisfaction → retention	–	–	0.217	Rejected
	H1a. Satisfaction with salary → retention	Positive, very low	0.193	0.023	Confirmed
	H1b. Satisfaction with leadership → retention	Negative, very low	- 0.170	0.045	Rejected
	H1c. Satisfaction with colleagues → retention	–	–	0.557	Rejected
	H1d. Satisfaction with promotions → retention	–	–	0.167	Rejected
	H1e. Satisfaction with nature of work → retention	–	–	0.203	Rejected
Private IT organizations	H2. Job satisfaction → retention	–	–	0.125	Rejected
	H2a. Satisfaction with salary → retention	Positive, low	0.298	0.001	Confirmed
	H2b. Satisfaction with leadership → retention	–	- 0.072	0.450	Rejected
	H2c. Satisfaction with colleagues → retention	–	0.006	0.953	Rejected
	H2d. Satisfaction with promotions → retention	–	0.129	0.147	Rejected
	H2e. Satisfaction with nature of work → retention	–	0.105	0.269	Rejected

Source: Research data (2021)

In analyzing the five dimensions of satisfaction (satisfaction with colleagues, with leadership, with salary, with promotions and with nature of work) (Siqueira, 2008), we verified that **satisfaction with colleagues** presented the highest average score (5.25 for professionals in public IT organizations; 4 for professionals in private IT organizations). Despite the result, this dimension was not correlated to retention of these professionals in either public nor private IT organizations, therefore the study rejects H1c and H2c. Furthermore, retention was not positively correlated to the level of **satisfaction with leadership**, **satisfaction with promotions** nor **satisfaction with the nature of work** in either public or private IT organizations, thus we reject H1b, H2b, H1d, H2d, H1e and H2e.

Finally, the study confirms the hypotheses which state **satisfaction with salary** relates to retention in both public (H1a) and private IT organizations (H2a).

5 DISCUSSION AND PERSPECTIVES

This study demonstrates no relation between global job satisfaction in IT professionals and their retention by public or private IT organizations. The only dimension of satisfaction which showed statistically significant positive relation with the retention of professionals in both types of organizations (public and private) was satisfaction with salary.

These results contradict prior evidence (Terera & Ngirande, 2014; Yamamoto, 2011; Brooks et al. 2015). To understand these results (H1 and H2), we broaden the scope of analysis (Brooks et al., 2015) by proposing two related interpretations: a) the characteristics of the job market in IT, and b) the entrenchment of IT professionals in the organization in which they work.

Regarding the first perspective, we highlight the behaviour of the job market in the period when the data were collected (the second semester of 2016 for private organizations, and the second semester of 2018 through the first semester of 2019 for public organizations). Both core IT jobs (IT positions in IT organizations) and in-house IT jobs (IT positions in public sector and other organizations) grew in the last 10 years; however, core IT jobs grew more than double what in-house IT jobs grew (growth of 131% vs. 53%, respectively) (SOFTEX, 2019). As such, the difference between each group diminished over time. That is, in 2007, in-house IT positions employed 70% of all professionals in the formal work market, while core IT positions employed only 30%; but in 2017, these percentages shifted to 60% and 40% respectively (SOFTEX, 2019).

This aspect of the Brazilian job market might have contributed to the permanence of professionals in institutions where they're dissatisfied or indifferent. These professionals engage the development of new competencies and the establishment of networks to improve their employability until they receive a better job proposal (van Dam, van der Heijden, & Schyns, 2006), or to start their own IT business (Landoni, 2018).

The second perspective refers to the organizational entrenchment of IT professionals. It is a type of bond the professional develops, characterized by the "importance of investments and social roles acquired by the worker over time, and the compensation from these behaviours, which would be lost if they left the organization, and are difficult to regain in a different context" (Rodrigues & Bastos, 2012, p.689). The organizational entrenchment has three dimensions. The first is the *individual adjustment to social positions*. This refers to the investments the professional already made for their adaptation in the organization, which would be lost if they left the organization. These investments include participation in training, time for knowing processes and attributions of the position, relationships built at the organization, among other aspects which contribute to their adjustment and recognition at the organization. The second dimension refers to *impersonal bureaucratic arrangements*. These relate to financial stability and benefits which would be lost if they left the organization (Rodrigues & Bastos, 2012). The third dimension is the *perception of restrictions and lack of feasible alternatives in the job market*. Organizational entrenchment is derived from the broader construct of career entrenchment (Carson, D., Carson, P., Phillips, & Roe, 1996), from which the first two dimensions (*individual adjustment to social positions* and *impersonal bureaucratic arrangements*) were kept.

The surveyed IT professionals have been on average for 6.89 years in their current IT organization for private organizations, and 14.28 years for public organizations. Meaning they have invested heavily in the company (*individual adjustment to social positions from entrenchment within an organization*). These investments are related to the adaptation to system development methodologies used by the organization, to the nature of collaborative work, to the decision-making process, to the level of responsibility achieved, to the technologies used and to the technical and social competencies expected from the professional in this context (Jian, Huang, Kein, & Tsai, 2018).

The IT professionals have also already developed their social capital in the organization. The social capital is "the sum of actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" (Nahapiet & Ghoshal, 1998, p.243). The formal and informal networks developed at the organization are sources of acquisition of new skills, transfer of knowledge and professional contacts. In accordance with Benner (2003, p.199), IT professionals maintain "market relevance of their skills by taking advantage of networks of information exchange in communities of workers who share similar types of expertise". As a function of direct and frequent contact with their professional colleagues, tacit knowledge is shared, which would not be possible if they were not in the organization. The contact network and mutual learning via sharing of tacit knowledge which occurs during the resolution of problems is the type of learning experience highly valued by IT professionals (Adams & Demaiter, 2008).

With their tenure in these organizations, the surveyed IT professionals possibly already acquired some financial stability and benefits, all of which would be lost if they voluntarily exited the organization (*impersonal bureaucratic arrangements from entrenchment within an organization*). Previous studies have already shown the relevance of these two factors (stability and benefits) to the permanence of IT professionals in American public organizations (Reid, Riemenschneider, Allen, & Armstrong, 2008) and of civil servants of the Brazilian Court of Justice (Botelho & Paiva, 2011). Indeed, in the present study, there was a positive correlation between satisfaction with salary of IT professionals of both public and private IT organizations and their retention. Although the strength of this correlation was low, it was significant. That is to say, in the research sample, the higher of satisfaction with salary of the IT professional, the longer the organization could retain them.

The COVID-19 pandemic aggravated the need for hiring IT professionals. This is a reality not only of big enterprises, but also small and medium businesses of virtually all sectors, which need to learn how to perform their business remotely and connect with clients virtually. The market for IT professionals expanded vastly with the digital transformation (Tripathi, 2021). In this context, the competition for IT professionals, which was already global, became even tougher.

In order to attract and retain good IT professionals, large organizations are paying more to these professionals, spawning a war for talents in the IT sector (He, 2018). This war for talents results in higher salaries and benefits for IT professionals, as they accumulate knowledge and experience in their positions at their organizations. The focus of career and salary planning has been, historically, on the internal job market (Dulebohn & Werling, 2007); due to concerns about the perception of salary equity and their consequences in the organization. However, beyond internal equity, IT professionals analyze external equity. External equity relates to the perception that the professional is being treated equally to other professionals in similar positions in other organizations (Werner & Mero, 1999). Equity scholars posit that turnover (along with absenteeism and job performance decrements) is "one of the main strategies used by employees to reduce their efforts in response to situations of organizational inequity" (Torre, Pelagatti, & Solari, 2015, p.410). Globalization, the pervasiveness of intercontinental remote work in IT, and global salary research in the sector allow IT professionals to compare their salaries not only to other people in their organization but to other professionals worldwide.

When an IT professional reaches a salary higher than the average in their own organization, they tend to compare their skills with the salary paid by other organizations for people with similar skills (external equity). If they find they have competitive skills and employability, they tend to exit their organization for another. However, if in this analysis they perceive restrictions in the job market and lack of alternatives in case they leave their job, their behaviour will be aligned to the third dimension of organizational entrenchment (Chen, Bozeman, & Berman, 2019).

Although the relationship between satisfaction with salary and retention in private and public IT organizations was low and very low, respectively, the existence of it signals that IT professionals more satisfied with their salaries tend to stay longer at organizations. We argue that the development of competencies and networking, as well as the organizational entrenchment of IT professionals are plausible explanations for this scenario. Some organizations fear offering training and development programs to their IT professionals, as they fear their investment will be lost when these professionals leave the organization. However, research shows that perceived learning opportunities of professionals in IT organizations are positively related with the intention to stay in the organization and negatively related with the intention to leave the organization (Steil et al., 2020).

These professionals evaluate then the advantages and disadvantages of their permanence in the organization taking into consideration their salary, their perception of development of competencies, valuable networking for the job market and the situation of the job market itself. As IT professionals have higher commitment to their career than to their organization (Buhari, Yong, &

Lee, 2020), when the organization no longer offers a satisfactory salary, the tendency is that these professionals will intensify their process of analysis of their employability and of the market itself, in order to leave the organization.

6 CONCLUSION

This study examined the relation between global job satisfaction, as well as its dimensions and the retention of IT professionals in public and private IT organizations. The conclusion showed that only the dimension satisfaction with salary was positively correlated with retention of IT professionals in public and private IT organizations.

From the theoretical background of this research, only the study of Iqbal et al. (2017) with public and private employees with different jobs revealed results pointing to the same direction as this study. They concluded that salary influences job satisfaction for workers and that his impacts their retention by organizations.

As our study shows different results from others about satisfaction and retention (Pekersen & Tugay, 2020), the results of our study can help managers of public and private organizations to establish more assertive retention strategies, based on evidence from IT professionals. The importance of salary as a variable which determines organizational behaviour has been discussed for decades under different perspectives (Park & Sturman, 2021), but rarely with IT professionals in IT private and public organizations in Brazil. We hypothesize that the actual characteristics of the job market in IT and the entrenchment of IT professionals in the organization in which they work may explain these results.

IT organizations delivering products and services with high added value on the global market need to carefully evaluate where their competitive differential is. As knowledge intensive organizations, it is known their main differential is based on the knowledge and competencies of the people who comprise the organization. The retention of IT professionals then means the retention of knowledge, skills and experience of these professionals, which are the most important assets of the knowledge economy.

In order to advance understanding of the relation between retention and job satisfaction in IT professionals, future research should investigate statistically the relationship between organizational entrenchment, the dimensions of job satisfaction, and the retention of professionals by their organizations (both public and private).

REFERENCES

Adams, T. L., & Demaiter, E. I. (2008). Skill, education and credentials in the new economy: the case of information technology workers. *Work, Employment and Society, 22*(2), 351–362. https://doi.org/10.1177/0950017008089109

Anis, A., Rehman, K. U., Rehman, I. U., Khan, M. A., & Humayoun, A. A. (2011). Impact of organizational commitment on job satisfaction and employee retention in pharmaceutical industry. *African Journal of Business Management, 5*(17), 7316-7324. DOI:10.5897/AJBM10.1296

ASSOCIAÇÃO CATARINENSE DE TECNOLOGIA - ACATE. (2020). *Acate Tech Report 2020: Panorama do Setor de Tecnologia Catarinense - Florianópolis/SC*. Observatório ACATE, Florianópolis, 96p.

ASSOCIAÇÃO BRASILEIRA DAS EMPRESAS DE TECNOLOGIA DA INFORMAÇÃO E COMUNICAÇÃO – BRASSCOM. (2019). *TI precisa de 420 mil novos profissionais até 2024.* Disponível em: https://brasscom.org.br/ti-precisa-de-420-mil-novos-profissionais-ate-2024/. Acesso em: 26/05/2021.

Barbosa, F. L. S., Bizarria, F. P. A., Rabêlo Neto, A., & Moreira, R. N. (2016). Visão multidimensional da satisfação do trabalho: um estudo em um hospital público piauiense. *REGE - Revista de Gestão, 23*, 99–110. http://dx.doi.org/10.1016/j.rege.2015.01.001

Benner, C. (2003). "Computers in the Wild": Guilds and Next-Generation Unionism in the Information Revolution. *International Review of Social History, 48*(Supplement 11), 181–204. DOI: 10.1017/S0020859003001317

Botelho, R. D., & Paiva, K. C. M. (2011). Comprometimento organizacional: Um estudo no Tribunal de Justiça do Estado de Minas Gerais. *Revista de Administração Pública, 45*(5), 1249-1283. https://doi.org/10.1590/S0034-76122011000500002

Brooks, N. G., Hardgrave, B. C., O´Leary-Kelly, A. M., McKinney, V., & Wilson, D. D. (2015). Identifying with the Information Technology Profession: Implications for Turnaway of IT Professionals. *The DATA BASE for Advances in Information Systems, 46*(1), 8-23. https://doi.org/10.1145/2747544.2747546

Buhari, M. M., Yong, C. C., & Lee, S. T. (2020). I am more committed to my profession than to my organization: professional commitment ad perceived organizational support in turnover. *International Journal of Human Capital and Information Technology Professionals, 11*(3), 37-58. DOI: 10.4018/IJHCITP.2020070103

Carson, K. D., Carson, P. P., Phillips, J. S., & Roe, C. W. (1996). A Career Entrenchment Model: Theoretical Development and Empirical Outcomes. *Journal of Career Development, 22*(4), 273–286. DOI:10.1177/089484539602200405

Chen, C. A., Bozeman, B., & Berman, E. (2019). The grass is greener, but why? Evidence of employees' perceived sector mismatch from the US, New Zealand, and Taiwan. *International Public Management Journal, 22*(3), 560–589. DOI: 10.1080/10967494.2018.1425228

Crespi-Vallbona, M., & Mascarilla-Miró, O. (2018). Job satisfaction. The case of information technology (IT) professionals in Spain. *Universia Business Review, 58*(2), 36–51. DOI: 10.3232/UBR.2018.V15.N2.02

Dulebohn, J. H., & Werling, S. E. (2007). Compensation research past, present, and future. *Human Resource Management Review, 17*(2), 191–207. https://doi.org/10.1016/j.hrmr.2007.03.002

Fávero, L. P., Belfiore, P. P., Silva, F. L., & Chan, B. L. (2009). *Análise de dados: modelagem multivariada para tomada de decisões.* São Paulo: Elsevier.

Gallardo-Gallardo, E., & Thunnissen, M. (2016). Standing on the shoulders of giants? A critical review of empirical talent management. *Employee Relations, 38*, 31-56. https://doi.org/10.1108/ER-10-2015-0194

Hair Jr., J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2009). *Análise Multivariada de Dados.* 6a edição. Porto Alegre: Bookman.

Harden, G., Boakye, K. G., & Ryan, S. (2016). Turnover Intention of Technology Professionals: A Social Exchange Theory Perspective. *Journal of Computer Information Systems*. DOI: 10.1080/08874417.2016.1236356

He, Z. (2018). Money held for moving stars: Talent competition and corporate cash holdings. *Journal of Corporate Finance, 51*, 210-234. https://doi.org/10.1016/j.jcorpfin.2018.06.002

Jian, J. J., Huang, W., Kein, G., & Tsai, J. C. (2018). The Career Satisfaction of IT Professionals With Mixed Job Demands. *IEEE transactions on engineering management, 67*(1), 30-41. DOI: 10.1109/TEM.2018.2870085

Iqbal, S., Guohao, L., & Akhtar, S. (2017). Effects of Job Organizational Culture, Benefits, Salary on Job Satisfaction Ultimately Affecting Employee Retention. *Review of Public Administration and Management, 5*(3). DOI:10.4172/2315-7844.1000229

Irabor, I., & Okolie, E. (2019). A Review of Employees' Job Satisfaction and Its Affect on Their Retention. Anais da Universidade Spiru Haret. *Economic Series, 19*(2), 93-114. https://doi.org/10.26458/1924

Judge, T. A., & Kammeyer-Mueller, J. D. (2012). Job attitudes. *Annual Review of Psychology, 63*, 341-367. https://doi.org/10.1146/annurev-psych-120710-100511

Khan, M. A., M. A., Rehman, K. U., Rehman, I. U., Safwan, N., & Ashman, A. (2011). Modeling link between internal service quality in human resources management and employees retention: A case of Pakistani privatized and public sector banks. *African Journal of Business Management, 5*(3), 949-959.

KPMG (2018). *KPMG in India's annual compensation trends survey 2018-19*. Disponível em: https://assets.kpmg/content/dam/kpmg/in/pdf/2018/04/KPMG-India-Annual-Compensation-Trends-Survey.pdf. Acesso em: 13/02/2021.

Ladeira, W. J., Sonza, I. B., & Berte, R. S. (2012). Antecedentes da satisfação no setor público: um estudo de caso na Prefeitura de Santa Maria (RS). *Rev. Adm. Pública, 46*(1), 71–91.

Landoni, M. O. (2018). How technology travels from old to new firms: 'The role of employees' entrepreneurship in technology ventures. In Presse, A., & Terzidis, O. (eds). *Technology Entrepreneurship.* FGF Studies in Small Business and Entrepreneurship. Springer, Cham. https://doi.org/10.1007/978-3-319-73509-2_14

Lee, P. C. B. (2004). Social support and leaving intention among computer professionals. *Information & Management, 41*(3), 323–334. DOI:10.1016/ S0378-7206(03)00077-6

Magalhães, M. O. (2008). Propriedades psicométricas da versão brasileira da Escala de Entrincheiramento na Carreira. *Psico-UFSC, 13*(1), 13-19.

Martinez, M. C., & Paraguay, A. I. B. B. (2003). Satisfação e saúde no trabalho: aspectos conceituais e metodológicos. *Cadernos de Psicologia Social do Trabalho, 6*, 59–78. https://doi.org/10.11606/issn.1981-0490.v6i0p59-78

McKnight, D. H., Phillips, B., & Hardgrave, B. C. (2009). Which reduces IT turnover inten- tion the most workplace characteristics or job characteristics? *Information & Management, 46*(3), 167–174. DOI: https://doi.org/10.1016/j.im.2009.01.002

Meirelles, F. S. (2020). *Uso da TI - Tecnologia da Informação nas Empresas: Pesquisa Annual da FGVcia.* 32ª ed. FGV. Disponível em: https://eaesp.fgv.br/sites/eaesp.fgv.br/files/u68/fgvcia2021pesti-relatorio.pdf. Acesso em: 15/10/2020.

Mourmant, G., Gallivan, M. J., & Kalika, M. (2009). Another road to IT turnover: The entrepreneurial path. *European Journal of Information Systems, 18*(5), 498–521. https://doi.org/10.1057/ejis.2009.37

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital and the organizational advantage. *Academy of Management Review, 23*(2), 242–266. https://doi.org/10.5465/amr.1998.533225

Pant, J. J., & Venkateswaran, V. (2019). Exploring millennial psychological contract expectations across talent segments. *Employee Relations, 41*(4), 773-792. https://doi.org/10.1108/ER-04-2018-0096

PageGroup. (2020). *Covid-19 provoca onda de contratações de profissionais de tecnologia.* Disponível em: https://www.michaelpage.com.br/advice?page-index=1. Acesso em: 15/08/2021.

Park, S., & Sturman, M. C. (2021). When perception is reality, there is more than one reality: The formation and effects of pay-for-performance perceptions. *Personnel Psychology*, 1-27. DOI: 10.1111/peps.12466

Pedrycz, W., Russo, B., & Succi, G. (2011). A model of job satisfaction for collaborative development processes. *The Journal of Systems and Software, 84*, 739–752. DOI: 10.1016/j.jss.2010.12.018

Pekersen, Y., & Tugay, O. (2020). Professional satisfaction as a key factor in employee retention: a case of the service sector. *Journal of Turism and Services, 11*(20), 1-27. DOI: 10.29036/jots.v11i20.123

Rodrigues, A. C. A. & Bastos, A. V. B. (2012). Entrincheiramento organizacional: construção e validação da escala. *Psicologia: Reflexão e Crítica, 25*(4), 688-700.

Sabbagha, S. M., Ledimo, O., & Martins, N. (2018). Predicting staff retention from employee motivation and job satisfaction. *Journal of Psychology in Africa, 28*(2), 136–140. DOI:10.1080/14330237.2018.1454578

Reid, M. F., Riemenschneider, C. K., Allen, M. W., & Armstrong, D. (2008). Information technology employees in state government: A study of affective organizational commitment, job involvement, and job satisfaction. *American Review of Public Administration, 38*(1), 41–61. DOI: 10.1177/0275074007303136

Rodrigues, A. C. A., & Bastos, A. V. B. (2012). Entrincheiramento organizacional: construção e validação da escala. *Psicologia: Reflexão e Crítica, 25*(4), 688-700. https://doi.org/10.1590/S0102-79722012000400008

Rueda, F. J. M. (2015). Análise fatorial confirmatória da Escala de Satisfação no Trabalho nas versões de 25 e 15 itens. *Revista Psicologia: Organizações e Trabalho, 15*(1), 82-88. DOI: 10.17652/rpot/2015.1.436

Siqueira, M. M. M. (2008). Satisfação no trabalho. In *Medidas do Comportamento Organizacional.* Porto Alegre: Artmed, 265–274.

Sharma, P. K., Misra, R. K., & Mishra, P. (2017). Job Satisfaction Scale: Adaptation and Validation Among Indian IT (Information Technology) Employees. *Global Business Review, 18*(3), 703–718. DOI: 10.1177/0972150917692186

SOFTEX - ASSOCIAÇÃO PARA PROMOÇÃO DA EXCELÊNCIA DO SOFTWARE BRASILEIRO. (2019). *Persona TI: Caracterização do Profissional de TI e evolução de suas principais especificidades nos últimos 10 anos.* Observatório Softex, 47p. Disponível em: https://softex.br/inteligencia/#cadernostematicos. Acesso em: 26/05/2021.

Steil, A. V., Penha, M. M., & Bonilla, A. M. (2016). Antecedentes da retenção de pessoas em organizações: Uma revisão de literatura. *Revista Psicologia: Organizações e Trabalho, 16*(1), 88-102. DOI: 10.17652/rpot/2016.1.542

Steil, A. V., Dandolini, G. A., Souza, J. A., Cuffa, D., & Costa, R. (2018). Behavioral Intentions and Retention of Technical and Scientific Staff in Research and Development Organizations. *International Journal of Human Capital and Information Technology Professionals*, *9*(2). DOI: 10.4018/IJHCITP.2018040102

Steil, A. V., Cuffa, D., Iwaya, G. H., & Pacheco, R. C. S. (2020). Perceived learning opportunities, behavioral intentions and employee retention in technology organizations. *Journal of Workplace Learning, 32*(2), 147-159. https://doi.org/10.1108/JWL-04-2019-0045

Terera, S. R., & Ngirande, H. (2014). The impact of rewards on job satisfaction and employee retention. *Mediterranean Journal of Social Sciences*, *5*(1), 481-487. DOI: 10.5901/mjss.2014.v5n1p481

Torre, E. D., Pelagatti, M, & Solari, L. (2015). Internal and external equity in compensation systems, organizational absenteeism and the role of explained inequalities. *Human Relations, 68*(3), 409–440. DOI: 10.1177/0018726714528730

Tripathi, S. (2021). Determinants of Digital, Transformation in the Post-Covid-19 Business World. *IJRDO - Journal of Business management*, *7*(6), 75-81.

Trusson, C. & Woods, F. (2017). 'An end to the job as we know it': how an IT professional has experienced the uncertainty of IT outsourcing. *Work, employment and society, 31*(3) 542–552.

van Dam, K., van der Heijden, B., & Schyns, B. (2006). Employability en individuele ontwikkeling op het werk. *Gedrag and Organisatie*, *19*(1), 53-68.

Vulpi. (2020). *IT Recruiter Trends.* Vulpi, plataforma de recrutamento de profissionais de TI. Disponível: https://sindpd.org.br/sindpd/site/noticia.jsp?Qual-e-o-perfil-dos-desenvolvedores-no-Brasil-e-quanto-ganham-em-media-&id=1600977446768. Acesso em: 28/05/2021.

Werner S., & Mero, N. P. (1999). Fair or foul? The effects of external, internal, and employee equity on changes in performance of major league baseball players. *Human Relations*, *52*(10), 1291–1311. DOI: 10.1177/001872679905201004

Westlund, S. G., & Hannon, J. C. (2008). Retaining talent: assessing job satisfaction facets most significantly related to software developer turnover intentions. *Journal of Information Technology Management, XIX*(4).

Yamamoto, H. (2011). The relationship between employee benefit management and employee retention. *The International Journal of Human Resource Management, 22*(17), 3550-3564.

Zhang, L., & Jones, M. C. (2011). A Social Capital Perspective on IT Professionals' Work Behavior and Attitude. *Journal of Organizational and End User Computing (JOEUC), 23*(1), 64-78. DOI:10.4018/joeuc.2011010104

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2. Development of hypotheses or research questions (empirical studies)	√	√	√	√
3. Development of theoretical propositions (theoretical work)	√	√		
4. Theoretical foundation / Literature review	√	√	√	
5. Definition of methodological procedures	√	√	√	√
6. Data collection	√	√	√	
7. Statistical analysis			√	√
8. Analysis and interpretation of data	√	√	√	
9. Critical revision of the manuscript	√	√	√	√
10. Manuscript writing	√	√	√	√
11. Other (please specify)				

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Conflict of Interest

The authors have stated that there is no conflict of interest.

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